

Garden Task

Support Balance Between Species

Supporting healthy ecosystems is a critical task in the garden because populations of different species are often in flux. Gardeners need to continually monitor and make decisions in regard to population levels of various species ('beneficial', 'pest', 'pollinators', 'decomposers' etc).



Connections to Science Content

What do we need to know in order to do the garden task?

Plant & Animal Needs: Knowing about plant and animal habits, habitats, and needs can help us support or deter species in the garden.

- For example, pollinators need nearby food and water sources throughout the seasons so gardeners might plant a variety of flowering plants to form a connected corridor.

Life cycles: Understanding life cycles can help us see how plant and animal needs change in different seasons and stages of their life. This can help us make decisions about how (and when) to support or deter species in the garden.

- For example: Ladybug larvae look very different from ladybug adults. Identifying them is important when choosing to deter or support ladybugs in the garden. In addition to aphids, some ladybug species may also need pollen and nectar as adults.

Ecosystem Roles: All species and kinds have roles in ecosystems. Consider the role of different species in the garden and how they interact with other species. Before making a decision, we need to understand how the decision might affect the biodiversity in an ecosystem.

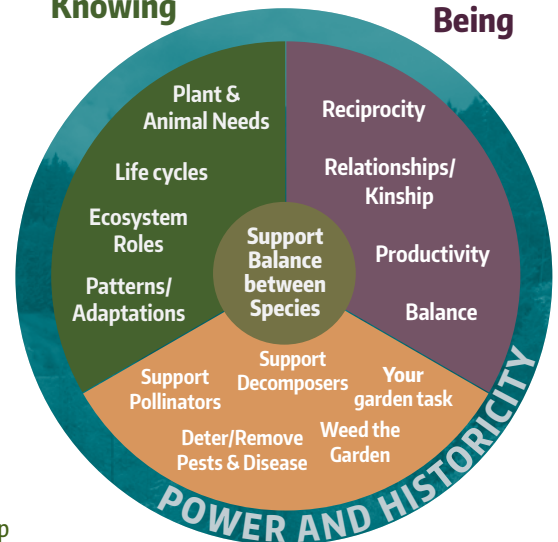
- For example, "invasive" species may be an important food source to pollinators. Or, using pesticides can affect pollinators negatively.

Patterns/Adaptations: Understanding the seasonal rhythms and patterns of species can help us make decisions on how to support species in the garden.

- For example, when supporting pollinators it is important to understand the timing of pollinators and flowering plants as we also consider the migration patterns of pollinators and their needs across places.

Knowing

Being



Doing

Garden Methods

What are methods we use to do this garden task?

Support Pollinators

- Set up insect hotels
- Install bird baths or feeders
- Plant flowers
- Avoid ground nesting bee burrows
- Leave plants (stalks and seeds) up in the fall for food and shelter for bugs

Weed the Garden

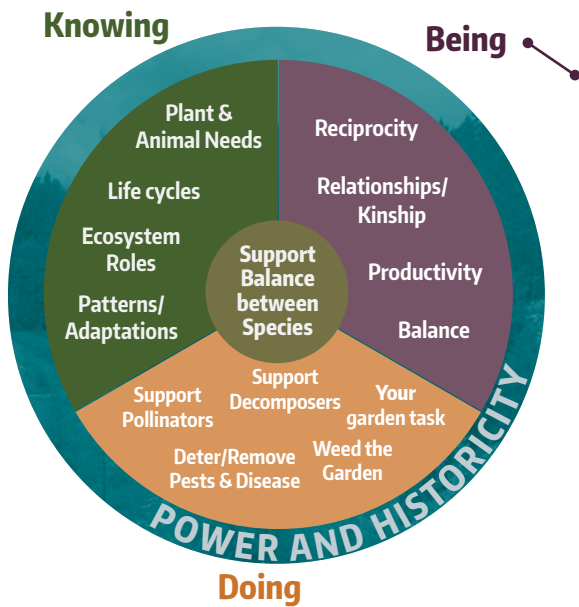
- Mulch for weed suppression
- Thin seedlings
- Remove unwanted plants (pull, smother, cut, etc)

Deter/Remove Pests and Disease

- Net or bag fruit trees
- Use floating row cover
- Squish pests
- Remove diseased plant materials
- Set pest traps (e.g. slugs)
- Spray pests with water
- Remove old leaves
- Introduce predatory insects
- Set up fences around the garden (rabbits/squirrels/cats)
- Horticultural oils or insecticidal soap

Support Decomposers (see soil health*)

- Maintain worm bins
- Maintain compost systems
- Cover soil with leaves, burlap sacks, etc
- Turn under old plant material



Importance/Intent

Why does it matter to me/my family/our broader community to do this garden task? How does this garden task affect people outside of my community?

Our garden decisions are driven by the values of our communities and families:

Indigenous Sovereignty:

How is the way you are gardening supporting Indigenous livelihoods and rights? Whose land are we on and what is our ethical responsibility to Indigenous peoples and relationships to this land?

- Many pesticides harm fish and their habitat. In Washington State, the Point Elliott Treaty preserves fishing rights of certain Coast Salish Tribes in their usual and accustomed places. How can we garden in a way that protects Tribes' sovereign right to harvest healthy and abundant salmon?

Futurity:

It is important to consider the lasting impacts of the garden method (5 years, 20 years, 100 years).

- E.g., How might planting a pollinator pathway help pollinators move into new areas in response to climate change?

Reciprocity:

Humans can help pollinators and other beneficial insects by planting flowers or leaving plants up in the fall. In turn, pollinators help plants set fruit and give gifts (like honey!)

- Gardens are shared spaces amongst various species and kinds. Who is safe and welcome in the garden?

Thriving & Sustenance

A healthy garden is a productive garden that provides sustenance to both the garden ecosystem and the gardener. Decision-making around 'pests', diseases or other 'threats' to the garden should include the greater health and thriving of the whole garden, and not be solely about productivity for humans.

Balance:

How we determine what is "good" or "bad", such as if an insect is a pest or beneficial to the garden and, in turn, if we should eradicate it or encourage it, helps us focus on understanding what systems need to be in balance for the garden to be healthy.



CONNECTING TO OTHER GARDEN PRACTICES

- ***Soil Health:** minimizing disturbances to invertebrates that live or nest in the soil, leaving/removing leaf cover, leaving dead plants for bug habitats, composting to promote invertebrates in the soil
- **Garden Planning:** documenting invasive species, planting plants that attract pollinators or attract predatory insects
- **Plant Growth and Development:** removing leaves to deter pests or diseases

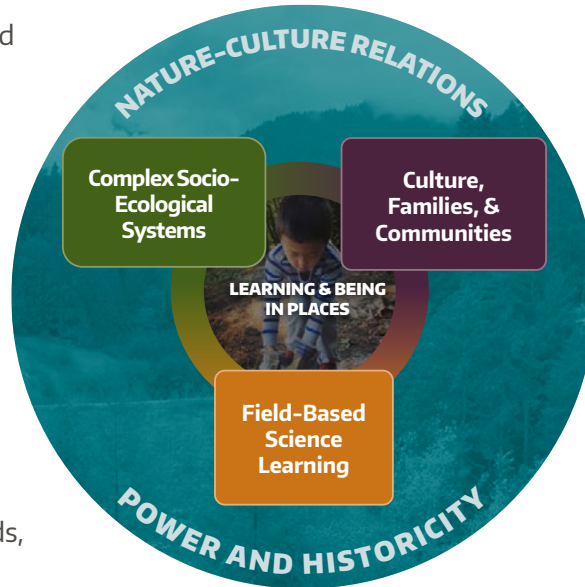
Engaging the Learning in Places Rhizome with Practice

Power and Historicity; Nature-Culture Relations:

- What is a “good” bug or a “bad” bug? Who decides? What is an “invasive” plant or weed? When? Where? How do we determine that?
- Insects have an important ecosystem role, what would a world without insects look like? (consider the important role of decomposers, pollination for fruit production, insects as a food source for animals)
- How are pests and weeds defined and who defines them? Why are some nutritious and easily-grown plants, like dandelions, considered weeds rather than food?

Complex Socio-Ecological Systems:

- **Histories of Places:** how did changes to this place over time introduce new pests and diseases (e.g. settler-colonialism and global plant/seed trades introduced many pests and changed ecosystems overall) what are the histories of this invasive species, pest, or disease?
- What ‘pests’ thrive in human dominated spaces? For example, Canada geese love grassy waterfront yards, as do humans.



Culture, Families, and Communities:

- What can we learn from elders in our community about healthy pest management practices?
- How can we involve the community in healthy pest control?
- You and your garden neighbor will likely share garden pests and diseases. What are their practices?
- How can elders and other community members help us (re) define what we consider pests and weeds- are some “pests” nutritious plants we might want to tolerate in our gardens?

Field-Based Science Learning:

- **Data & Modeling:** How can we observe and monitor species in the garden to help us determine if the garden ecosystem is healthy? How can we visualize socio-ecological relationships in the garden and the patterns over time to frame should-we questions and guide ethical decision making?
- **Deliberation & Explanation:** How do we decide the pest/disease threshold before action is taken? How do we make equitable and just decisions for now and in the future?

Storyline Examples for Supporting Balance between Species

LE 2: COMMON “SHOULD WE” QUESTIONS

- » Should we ignore infestation?
- » Should we remove infected plants?
- » What should we do to prevent a possible infestation/infection?
- » Should we plant a pollinator garden?

LE 4: GARDEN METHODS

- » Treatment methods
- » Monitoring methods

LE 6: DATA COLLECTION CONNECTIONS

- » What are the patterns of pests and diseases over time?

LE 6: SAMPLE INVESTIGATION QUESTIONS

- » Where do we find the most bugs (certain plants, in the sun, by water, etc) (Invertebrate Biodiversity Tally Protocol)
- » What plants have the most bugs on them? (Biodiversity Species Type and Abundance)
- » How does the density of aphids vary in different places in the garden?